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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/181,809 10/29/98 ISHII

T 101327

EXAMINER

WM02/0411

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P O BOX 19928
ALEXANDRIA VA 22320

CHULK

ART UNIT

PAPER NUMBER

2651

DATE MAILED:

04/11/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

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Office Action Summary

Application No.

09/181,809

Applicant(s)

ISHII ET AL.

Examiner

Kim-Kwok CHU

Art Unit

2651

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-55 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-55 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claims ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892)
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 18) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other: _____

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 1-10, 21, 35-39 and 55 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

(a) claim 1 is a single means claim containing only a "recording layer including an optical recording material" which covered every conceivable means for achieving the stated purpose (rotates the light angle and functions as a half-wave plate) was held nonenabling for the scope of the claim because the specification disclosed at most only those means known to the inventor; and

(b) similarly, in claims 21, 35, 37, 39 and 55 is a single means claim which covered every conceivable means for achieving the stated purpose was held nonenabling for the scope of the claim because the specification disclosed at most only

those means known to the inventor.

3. Claims 2-10, 36 and 38 not mentioned above are rejected base on its dependence on a rejected claim.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --
(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of the application for patent in the United States.

5. Claims 1-34, 36, 38 and 41-55 are rejected under 35 U.S.C. § 102(B) as being anticipated by Tsujioka et al. (U.S. Patent 5,316,900)

Tsujioka teaches an optical recording medium having all of the steps recited in claims 1-34, 36, 38 and 41-55. For example, Tsujioka teaches the following:

(a) a light source 5 for radiating a recording/reproducing light along a diameter direction of an optical recording medium 9 (Fig. 4);

(b) a light focusing system 6, 7 and 8 (Fig. 4);

(c) a reproducing light system 5 that irradiates said

optical recording medium with reproducing light (Fig. 4);

(d) at least one optical layer 2 (Fig. 1);

(e) the optical layer 2 including an optical material that changes a state of photo-induced birefringence in response to recording light (Fig. 6; column 11, line 8);

(f) a portion of the recording layer 2 that changes a state of photo-induced birefringence acting optically as a half-wave plate (Fig. 1; inherent feature of the optical material which is a light polarizer/modulator);

(g) as in claims 2 and 12, said recording layer 2 has a refractive index expresses in variables of wavelength and thickness as $\Delta n * d = (m + 1/2) * \lambda$ (inherent feature where the a light refraction angle depends on an irradiating light's wavelength);

(h) as in claims 3 and 13, the photo-induced birefringence is caused by a refractive index change (inherent feature of the birefringence);

(i) as in claims 4, 5, 8, 14, 15 and 18, the recording layer 2 comprises a liquid crystal polymer (azobenzene) which is photoisomerized (column 11; line 2);

(j) as in claims 6, 9, 16 and 19, said polymer comprises at least one kind of monomer-polymer azobenzene;

(k) as in claim 7 and 17, the recording layer 2 comprises a polymer in which photoisomerized molecules are dispersed

(column 11; lines 2-10);

(l) as in claims 10, 20, 24, 28, 34, 36, 38, 48 and 51, the optical layer 2 has a disk shape recording medium (Fig. 1);

(m) as in claim 11, an optical reflection layer 4 (Fig. 1);

(n) as in claim 21, said optical recording layer that includes a material in which an azimuth of birefringence that is included by recording light changes in response to a rotation of a polarization angle of said recording layer (Figs. 8A-F; column 11, lines 2-10);

(o) as in claims 22 and 26, step of using the recording layer 2 to control a polarization angle of recording light (Figs. 8A-F: column 11, lines 2-10);

(p) as in claims 22 and 26, step of using the liquid crystal polymer as a half wave plate (inherent feature of the light polarization angle modulating polymer;

(q) as in claims 23, 27 and 32, directing the recording light to a polarization rotary device 7 (Fig. 4);

(r) as in claims 25 and 29, the optical element (azobenzene) is formed in a position at least partially coextensive an existing optical element in the optical recording medium 2 (Fig. 1);

(s) as in claims 30 and 31, a spatial optical modulator 7 that controls a polarization angle of said recording light

(Fig. 4);

(t) as in claims 33, 42, 45, 47 and 50, the optical recording apparatus having a medium driving and head moving mechanism (Fig. 4; disc driving and head moving mechanism is an inherent feature);

(u) as in claims 41 and 44, said reproducing light has a light intensity smaller than that of said recording light (inherent feature where data reading light intensity is always smaller than data writing intensity);

(v) as in claims 46, 49, 52, 53 and 54, an analyzing unit 52 that detects a polarization angle of recording light (Fig. 4; detector 10 detects the recording light and its polarization); and

(v) as in claim 55, said optical element formed on said recording layer adjust a polarization angle of a reproducing light by an amount greater than a difference between a polarization angle of recording light (inherent feature where the optical element is a wave plate).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 35, 37, 39 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsujioka et al. (U.S. Patent 5,316,900) in view of Chen et al. (U.S. Patent 5,488,597)

Tsujioka teaches an optical recording medium having a recording layer made of liquid crystal polymer (azobenzene) very similar to that of the instant invention. However, Tsujioka does not teach the following:

(a) as in claims 35, 37, 39 and 40, said recording medium stores multilevel information.

A multilevel information optical recording medium is formed by at least two layers of the same recording medium. It is becoming common that an optical storage disc contains several recording layers in order to increase its storage capacity. When there is a motivation of raising the storage limit of an optical recording medium, it would have been

obvious to one of ordinary skill in the art at the time of invention to use a multilayer recording medium such as Chen's instead of a single layer recording medium of Jsuioka's, because a multilayer recording medium has the advantage of storing multiple times of information than a single layer recording medium.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Kawanishi et al. (5,296,321) is pertinent because Kawanishi teaches a liquid crystal layer formed with azobenzene.

9. Any response to this action should be mailed to:

Commissioner of Patents and Trademarks Washington, D.C.
20231 or faxed to:

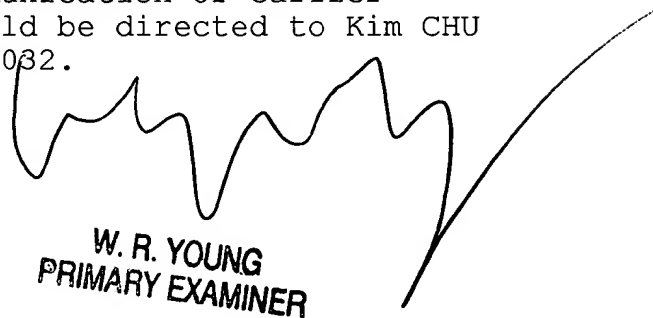
(703) 308-6306, (for formal communications intended for entry) or:

(703) 308-6306, (for informal or draft communications, please label "PROPOSED" or "DRAFT").

Hand-delivered responses should be brought to Crystal Park II, 2021 Crystal Drive, Arlington. VA., Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 305-4700.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kim CHU whose telephone number is (703) 305-3032.



W. R. YOUNG
PRIMARY EXAMINER

16C 4/4/2001

Kim-kwok CHU
Examiner AU2651
April 4, 2001

(703) 305-3032